



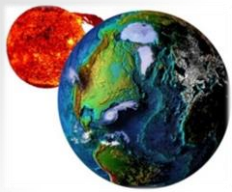
# *STP Quarterly Review*

30 Apr 2014  
2QFY14



William Denig  
Solar & Terrestrial Physics Division  
NOAA/NESDIS/NGDC  
303 497-6323

[William.Denig@noaa.gov](mailto:William.Denig@noaa.gov)



# OUTLINE

## Solar & Terrestrial Physics Division

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### ➔ STP Division Overview

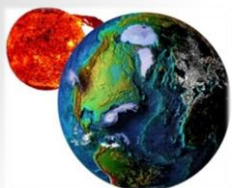
Milestones & Metrics

Program Updates

Special Interest Items

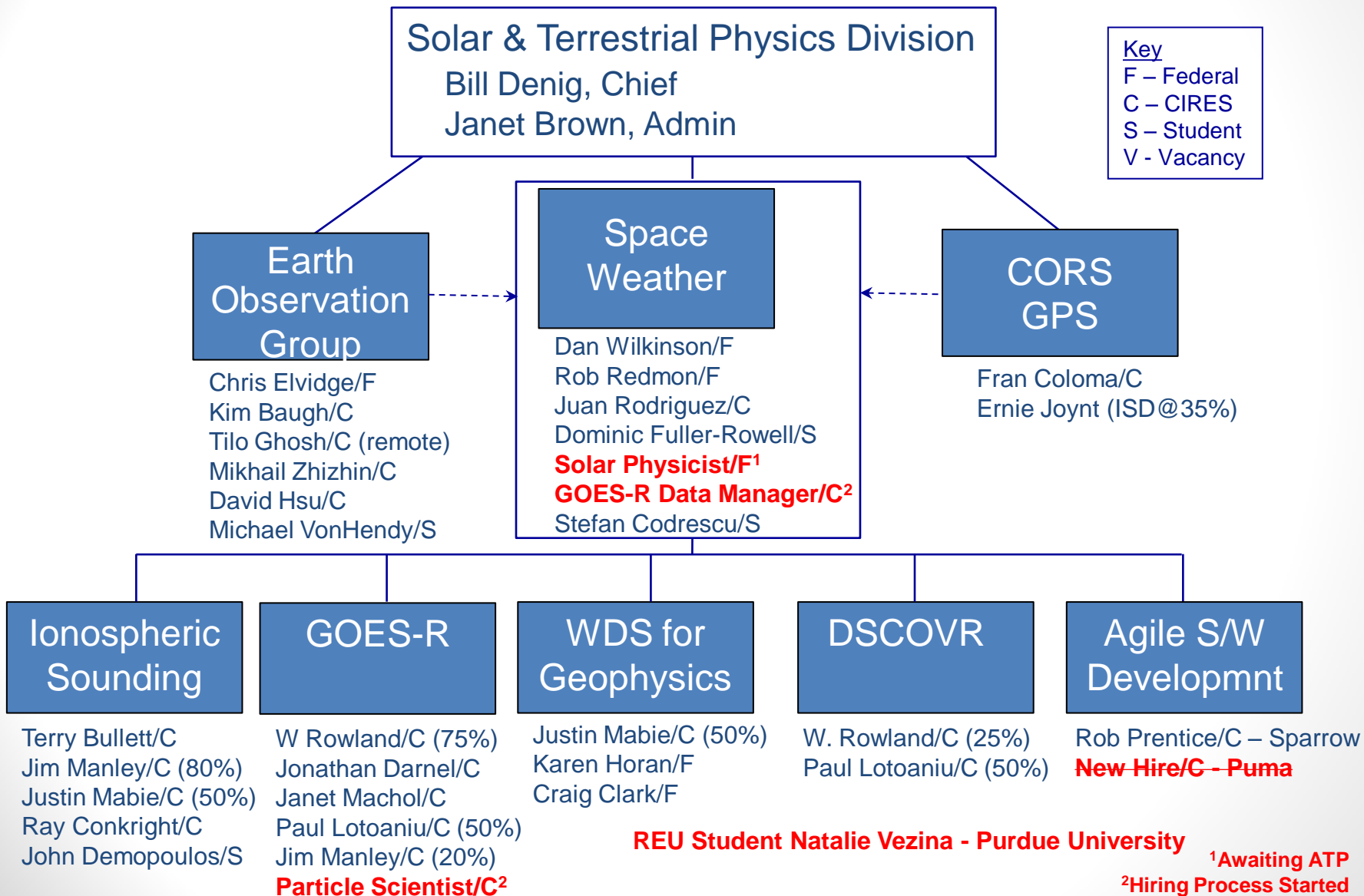
COPC: AF Environmental Data

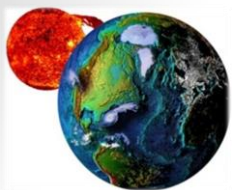
Issues & Summary



# STP Division Overview

## STP Organizational Chart





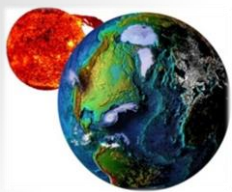
# STP Division Overview

## Featured Baby of the Quarter

### EUV and X-Ray Irradiance Sensors (EXIS)





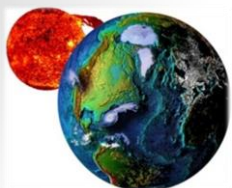


# STP Division Overview

## Upcoming Featured Baby of the Quarter

Tilo gave birth to Sahira (meaning mountain, Sanskrit origin) to a baby girl on the 9th of April. Sahira is doing fine; mom and dad expecting sleepless nights.





# STP Division Overview

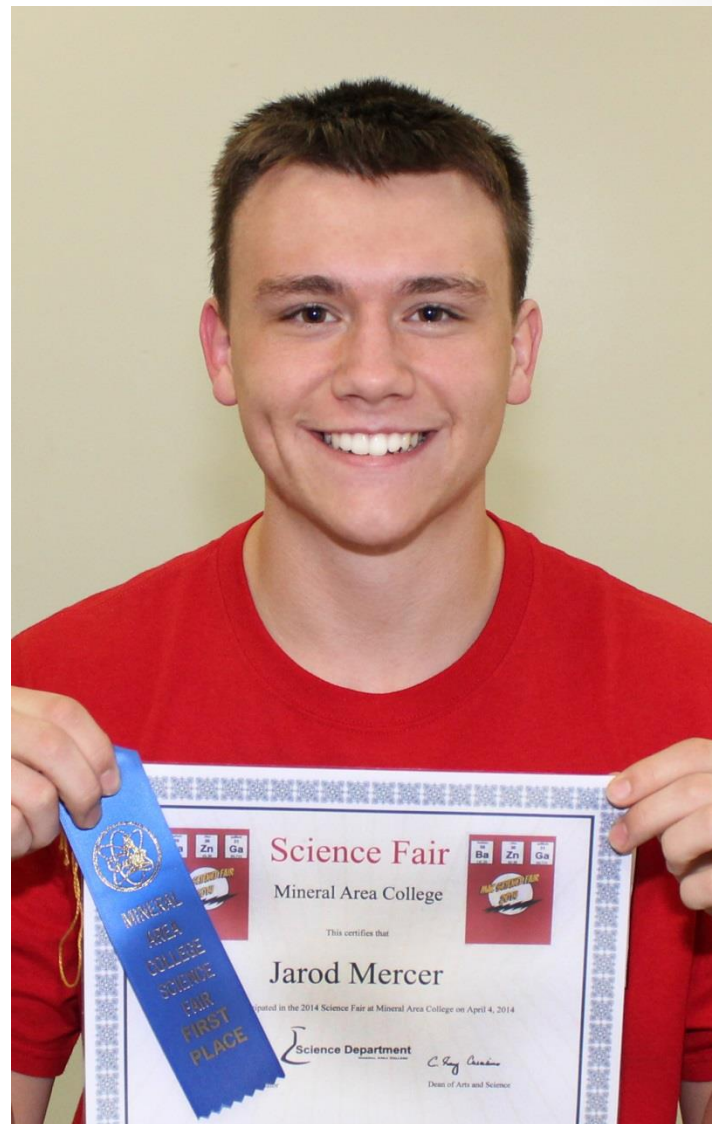
## Impacting the Next Generation

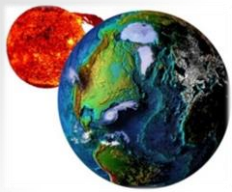
“Thank you very much for your resources. My student was so excited to think a scientist went out of his way to care about his project. You have made a very positive impression on him, and for that I am grateful.”

Mike Logan  
Biology Instructor  
Kingston K-14 School  
Cadet, Missouri



Hello Mr. Denig - I am the student which converted the archived data that you gave Mike Logan into statistical data. I entered the Mineral Area College science fair and specialized in earth science. I explained the data to the space station scientist and gave accurate information on how geomagnetism affects our U.S. Power grid and ways that I personally thought were significant to protect against these storms. In the statistical data I have found that geomagnetism is on the increase and we need to make measures to avoid the effects of the storms. I acknowledged you in the presentation and gave my gratitude. Thank you Mr. Denig, I wouldn't of been able to get first place at the science fair without your help. – Jarod Mercer





# OUTLINE

## Solar & Terrestrial Physics Division

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STP Division Overview

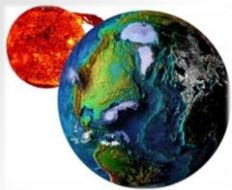
➔ Milestones & Metrics

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Special Interest Items

COPC: AF Environmental Data

Issues & Summary



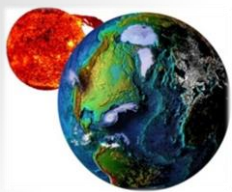
# Milestones and Metrics

## STP FY14 Milestones

Quarter	Milestone	AOP	Status
Q1	Produce Radiation Belt Indices for satellite situational awareness as requested by the Air Force Weather Agency. (Green)	NO	C
Q2	Ensure required infrastructure is in place to receive, archive and disseminate Deep Space Climate Observatory (DSCOVR) solar-wind data products prior to the DSCOVR launch readiness date. (Denig)	YES	C
Q2	Return the Ap* geomagnetic index to operations. (Mabie)	NO	C
Q2	Implement ingest of the NOAA Space Environment Monitor data into the NASA Coordinated Data Analysis web to increase public access to the data. (Redmon)	NO	C
Q3	Complete delivery of Level 2+ product Algorithm Theoretical Basis Documents for the Geostationary Operational Environmental Satellite series-R space weather products. (Rowland)	NO	
Q3	Deliver to the GOES-R Program Office an initial set of calibration and validation tools for Post-Launch Testing of the space weather sensors on the GOES-R series spacecraft. (Rowland)	NO	
Q4	Complete an initial re-design of the Space Physics Interactive Data Resource to enable more efficient processing and enhanced usability. (Zhizhin)	NO	
Q4	Recalibrate the NOAA solar irradiance data product from the Extreme Ultraviolet Sensors on the GOES-13, GOES-14 and GOES-15 satellites and provide public access to the data. (Machol)	NO	
Q4	Initiate construction of a state-of-the-art ionospheric sounder in the Antarctic for the Korean space weather program. (Bullett)	NO	
Q4	Create initial "Cloud-free Composite of Nightlights of the World" product using data from the NOAA Visible Infrared Imaging Radiometer Suite. (Elvidge)	YES	
As of 17 Apr 2013			

GOES L2+ algorithms slipped to Q3 due to late arrival of funds

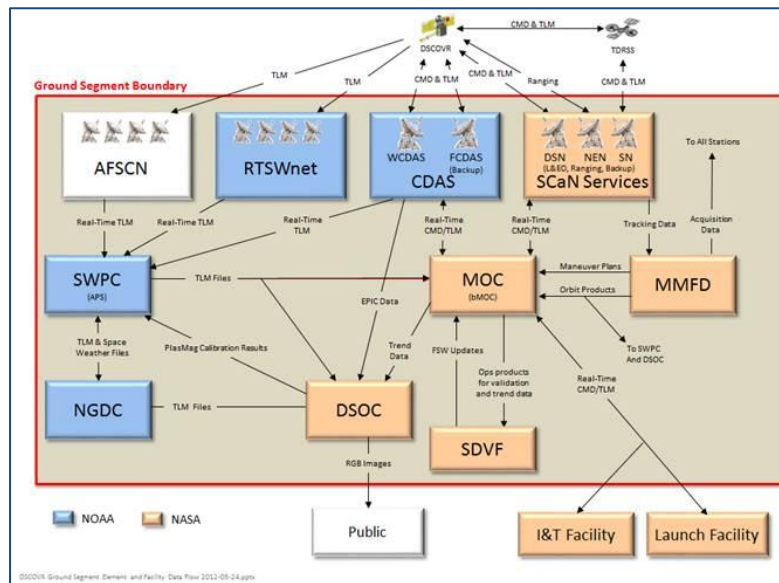




# Milestones and Metrics

## Milestone: DSCOVER Infrastructure Development

**Milestone:** Ensure required infrastructure is in place to receive, archive and disseminate Deep Space Climate Observatory (DSCOVER) solar-wind data products prior to the DSCOVER launch readiness date. (Rowland)



The screenshot shows the NOAA Deep Space Climate Observatory (DSCOVER) website. The table displays data for the period from 2014-03-17 to 2014-03-18. The table includes columns for Start Date, End Date, Data Type, Processing Environment, Processing Date, and Filesize.

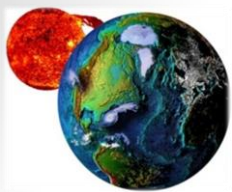
Start Date	End Date	Data Type	Processing Environment	Processing Date	Filesize
2014-03-17T00:00:00Z	2014-03-17T06:00:00Z	Real-Time Observational Telemetry	IT	2014-03-17T06:00:00Z	2.55 MB
2014-03-17T06:00:00Z	2014-03-17T12:00:00Z	Real-Time Observational Telemetry	IT	2014-03-17T12:00:00Z	2.67 MB
2014-03-17T12:00:00Z	2014-03-17T18:00:00Z	Real-Time Observational Telemetry	IT	2014-03-17T18:00:00Z	0.10 MB
2014-03-17T18:00:00Z	2014-03-17T24:00:00Z	Real-Time Observational Telemetry	IT	2014-03-17T24:00:00Z	0.00 MB
2014-03-18T00:00:00Z	2014-03-18T06:00:00Z	Real-Time Observational Telemetry	IT	2014-03-18T06:00:00Z	0.00 MB
2014-03-18T06:00:00Z	2014-03-18T12:00:00Z	Real-Time Observational Telemetry	IT	2014-03-18T12:00:00Z	1.03 MB
2014-03-18T12:00:00Z	2014-03-18T18:00:00Z	Real-Time Observational Telemetry	IT	2014-03-18T18:00:00Z	0.44 MB
2014-03-18T18:00:00Z	2014-03-18T24:00:00Z	Real-Time Observational Telemetry	IT	2014-03-18T24:00:00Z	0.16 MB
2014-03-19T00:00:00Z	2014-03-19T06:00:00Z	Real-Time Observational Telemetry	IT	2014-03-19T06:00:00Z	0.17 MB
2014-03-19T06:00:00Z	2014-03-19T12:00:00Z	Real-Time Observational Telemetry	IT	2014-03-19T12:00:00Z	0.13 MB

**Completion**

**Planned: 31 Mar14**

**Actual: 15 Mar 14**

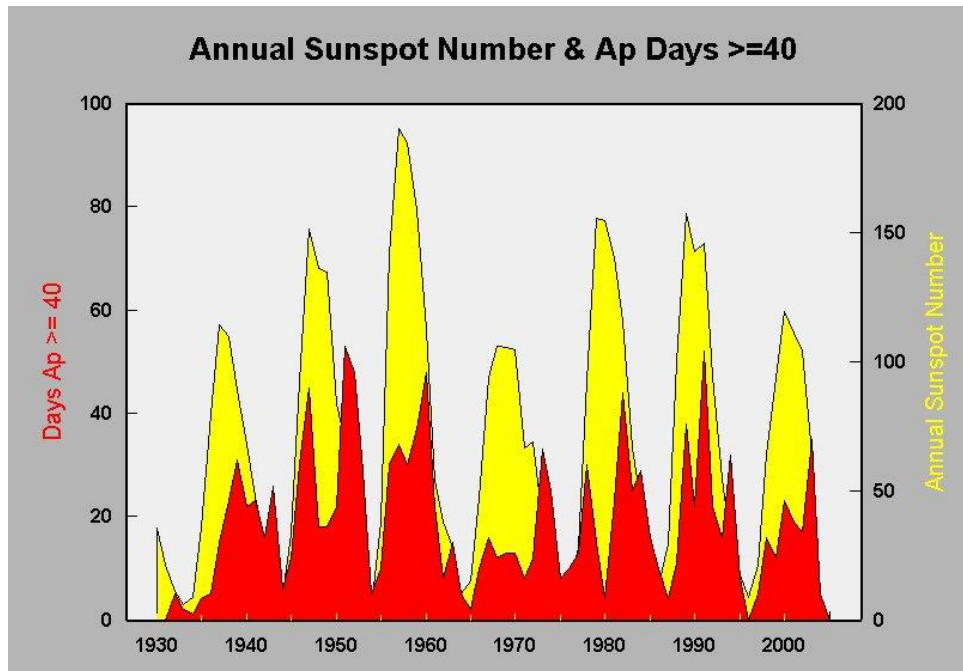
**Status:** Complete. The DSCOVER Infrastructure is now complete and ready to support launch and early-orbit ops.



# Milestones and Metrics

## Milestone: $A_p^*$ Geomagnetic Index

Milestone: Return the  $A_p^*$  geomagnetic index to operations. (Mabie)



Top Ten List <sup>1</sup>					<i>Dst</i>
	yyyy	m	d	$A_p^*$	#
1	1941	09	18	312	12
2	1960	11	12	293	17
3	1989	03	13	285	1
4	1940	03	24	277	11
5	1960	10	06	258	-
6	1959	07	15	252	4
7	2003	10	29	252	n/a
8	1960	03	31	251	19
9	1967	05	25	241	7
10	1982	07	13	229	21

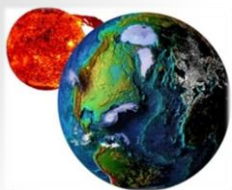
Completion

Planned: 31 Mar14

Actual: 31 Mar 14

Status: Complete. Algorithm has been re-implemented and dataset brought up-to-date.

<sup>1</sup> $A_p^*$  top 10 compared to largest geomagnetic storms in *Dst* (after Cliver & Svalgard [ 2005])



# Milestones and Metrics

## Milestone: SEM Data in NASA CDAWeb

Milestone: Implement ingest of the NOAA Space Environment Monitor data into the NASA Coordinated Data Analysis web to increase public access to the data. (Redmon)

### NOAA 19 Auroral Crossing on April 21, 2014

#### MEPED

#-flux > 40keV

0° - black

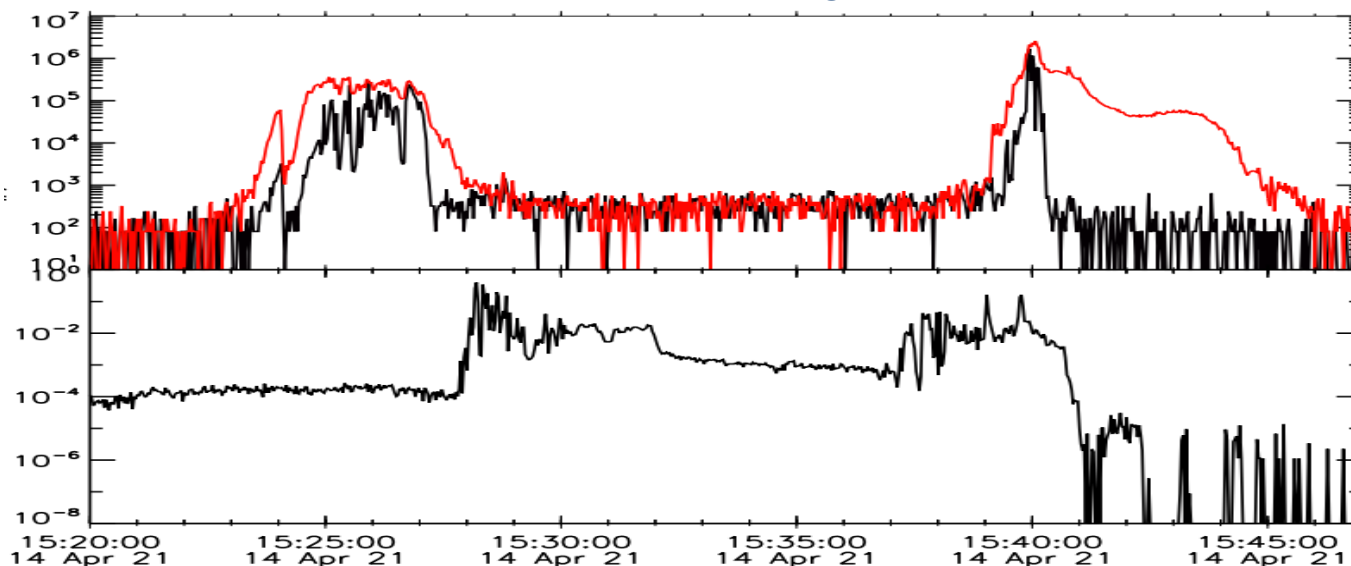
90° - red

#### TED

Energy-flux

50 eV -1 keV

0° Look



Please acknowledge data provider, NGDC and SWPC at NOAA and CDAWeb when using these data.  
Generated by CDAWeb on Wed Apr 23 13:31:29 2014

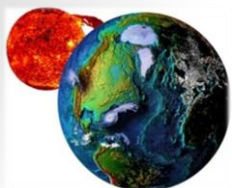
### Completion

Planned: 31 Mar 14

Actual: 31 Mar 14

Status: Complete. Final feedback is being collected from Dave Evans and Barbara Emery before final public release.

Prototype



# Milestones and Metrics

## FY14 Metrics Overview

Space Weather Metric							
Goal	Objective	Performance Measure	POC	1QFY14	2QFY14	3QFY14	4QFY14
Weather-Ready Nation (NWS)	A More Productive and Efficient Economy Through Environmental Information Relevant to Key Sectors of the U.S. Economy	Maintain a greater than 97% (2-sigma, cumulative distribution) of available Space Environment Monitor (SEM) data from the Geostationary Operational Environmental Satellites (GOES) archived on an annual basis	Wilkinson	100%	100%		
Ionosonde							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Weather-Ready Nation (NWS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Acquire, process and disseminate >97% (2-sigma, cumulative distribution) of available real-time ionosonde data within 1 hour [TBD] of receipt	Bullett	100%	100%		
Nighttime Lights Metric							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Climate Adaptation and Mitigation (CS)	Improved Scientific Understanding of the Changing Climate System and Its Impacts	Acquire, process and disseminate >97% (2-sigma, cumulative distribution) of available real-time nighttime lights imagery within 3 hours of receipt	Elvidge	100%	100%		
CORS (See Note)							
Goal	Objective	Performance Measure	POC	1QFY13	2QFY13	3QFY13	4QFY13
Resilient Coastal Communities and Economics (NOS)	Resilient Coastal Communities That Can Adapt To The Impacts Of Hazards And Climate Change	Provide a >97% (2-sigma, cumulative distribution) availability for CORS near-real-time data to the NWS Space Weather Prediction Center (SWPC) as per the '4-way' Memorandum of Agreement and subject to normal business-hour response times.	Coloma	100%	100%		

As of 17 Apr 2014



Greater than 99% (3-sigma) Cumulative Distribution



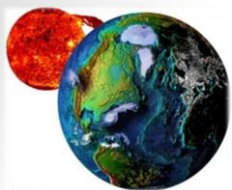
Greater than 84% (1-sigma) Cumulative Distribution



Greater than 97% (2-sigma) Cumulative Distribution



Below 84.1% (1-sigma) Cumulative Distribution



# OUTLINE

## Solar & Terrestrial Physics Division

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STP Division Overview

Milestones & Metrics

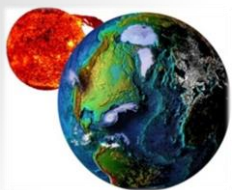
➔ Program Updates

Special Interest Items

COPC: AF Environmental Data

Issues & Summary





# Earth Observation Group

## Status: Nightfire

### Accomplishments:

- Implemented a dual Planck curve fitting procedure in the VIIRS Nightfire algorithm.
- Radiances in the long wavelength channels define the fit for the background.
- Radiances in the short-wave channels define the fit for the sub-pixel hot source.
- Resultant estimates provided for the hot source temperature, source size and radiant heat.

### Combustion parameters:

Source ID=SVM10\_npp\_d20130619\_t1841057\_e1846461\_IR\_source\_555

Lat=1.765773 Lon=101.265160 deg.

Temperature=778 deg. K

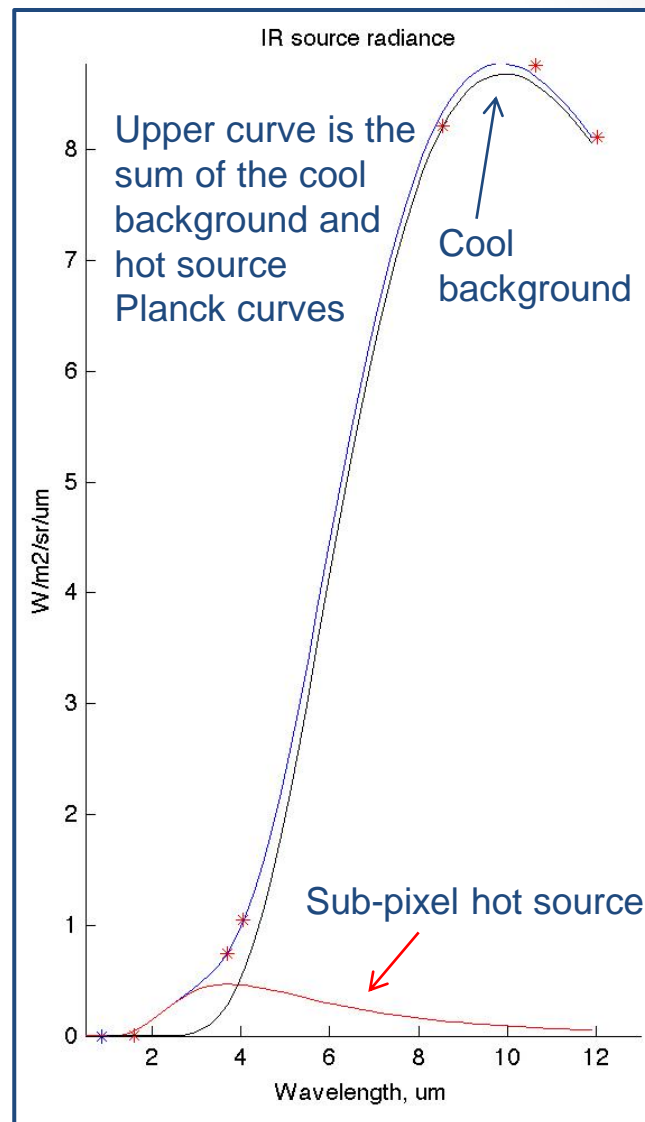
Radiant heat intensity=7.99 W/m<sup>2</sup>

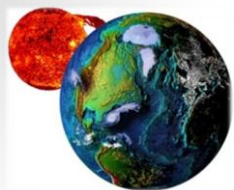
Radiant heat=4.88 MW

Source footprint=235.55 m<sup>2</sup>

Cloud situation=cloudy

Time=19-Jun-2013 18:46:38





# Space Weather Team

Status: Deep Space Climate Observatory

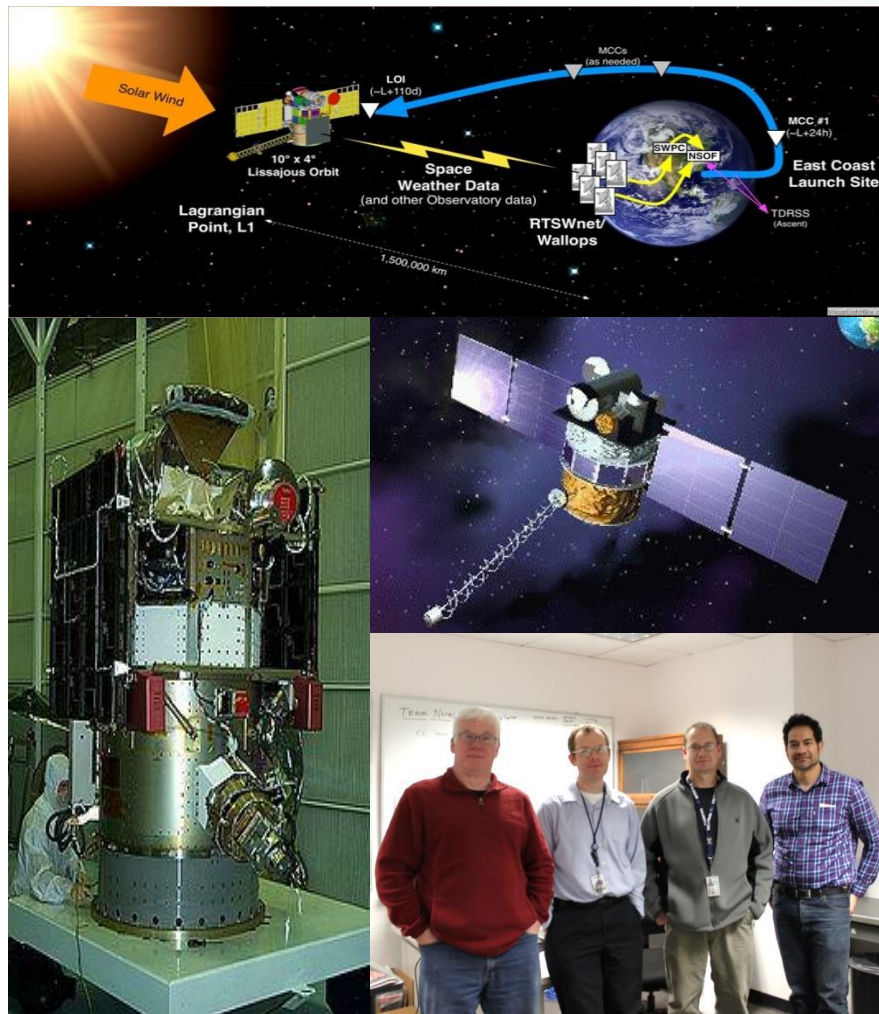


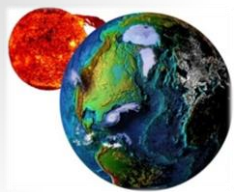
## Accomplishments:

- Leveraged NDGC Common Ingest (CI) for the ingest-to-archive of DSCOVR data from SWPC
- Verified use of NGDC EXTRACT (NEXT) for acquiring DSCOVR data
- Reported NGDC segment status at weekly and monthly program meetings
- Verified CI performance during Ground Readiness Test #1 (GRT1)

## Upcoming Events:

- GRT2 – 18 June 14
- Ops Readiness Rev – 29 Oct 14
- Mission Readiness Rev – 31 Dec 14
- Launch Readiness Rev – 12 Jan 15
- DSCOVR Launch – 15 Jan 15





# Space Weather Team

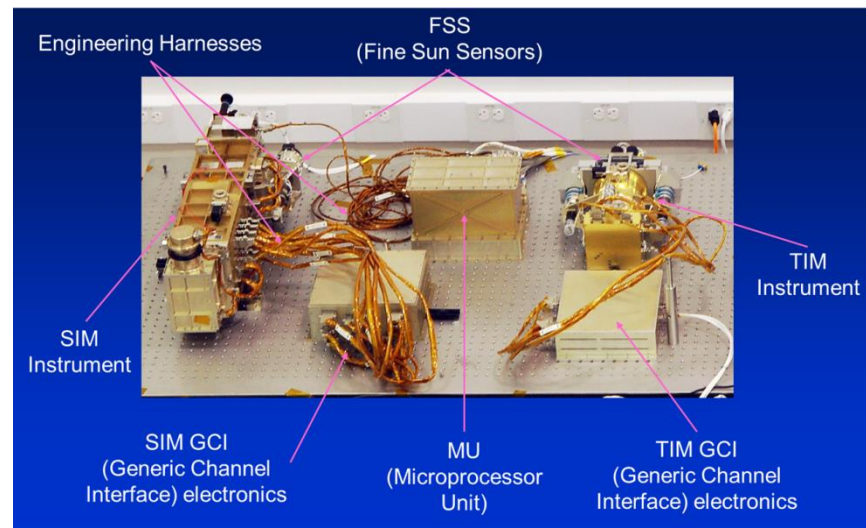
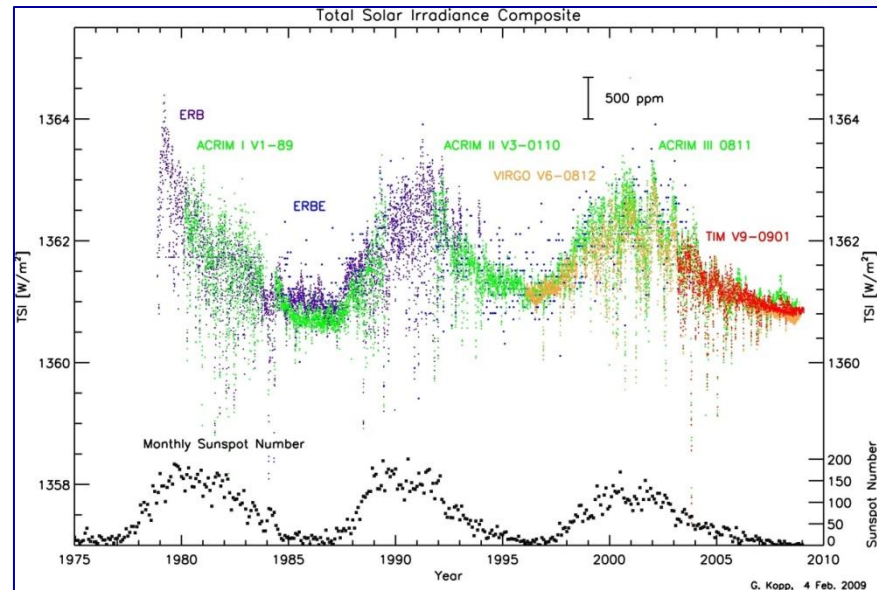
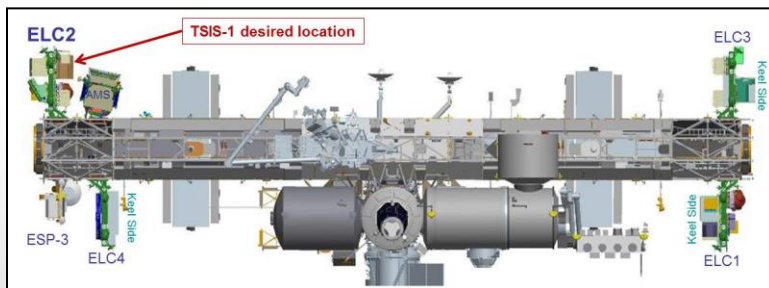
## Status: Total Solar Irradiance Sensor

### Accomplishments:

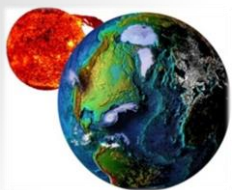
- Assumed position of TSIS Chief Scientist supporting OSD PM
- Supported PMC decision brief to accommodate TSIS on the International Space Station (ISS)
- Worked with LASP to determine that instrument design changes are not warranted for ISS

### Upcoming Events:

- ISS/TSIS Kickoff - May '14
- TSIS L1RD – Date [*TBD*]
- Launch Readiness Date (LRD) – Aug '17







# Space Weather Team

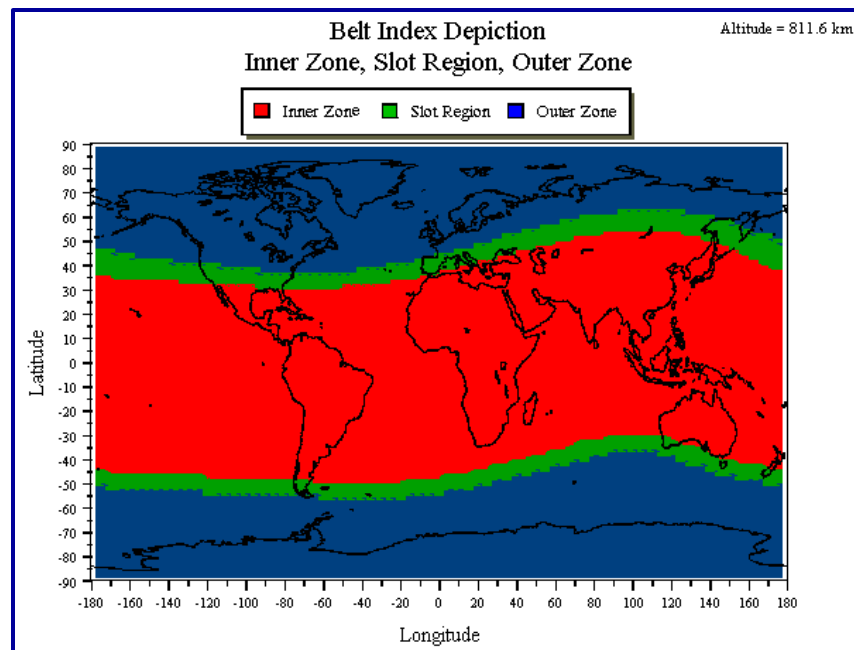
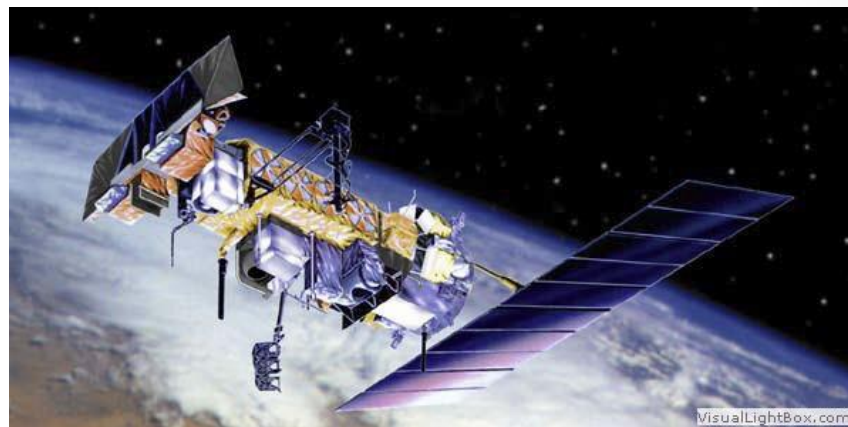
## Status: POES Space Environment Monitor (SEM)

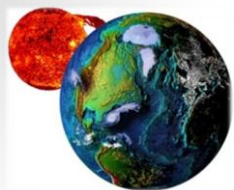
### Accomplishments:

- Completed transfer of function for POES monitoring and data processing from SWPC to NGDC
- Developed new in-house capability to process/re-process SEM data from POES (and MetOp)
- Provided POES belt indices to the AFWA for satellite hazard alerts

### Upcoming Events:

- Participate as a member of the organizing committee for Spacecraft Anomalies & Failures Workshop (Chantilly, VA) – July 2014
- Attend the 2014 Spacecraft Charging Technology Conference (Pasadena, CA) – 23-27 Jun 14
- Site visit to NRO planned





# Space Weather Team

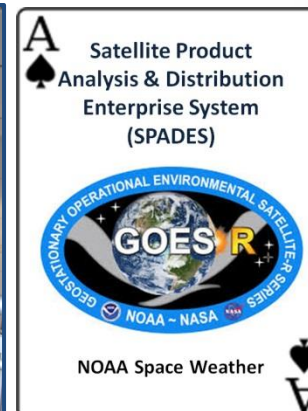
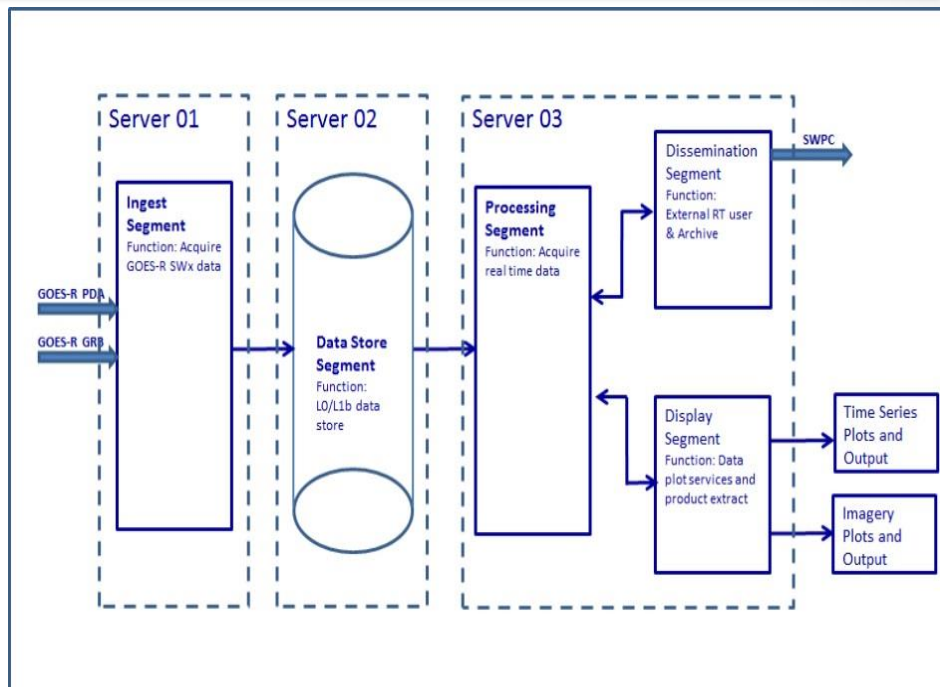
## Status: GOES-R Status (Overview)

### Accomplishments:

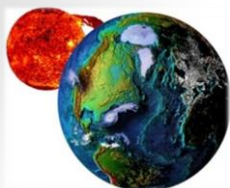
- AA-approved path forward for development of the Satellite Product Analysis and Distribution Enterprise System (SPADES) and path to operations
- Was appointed project lead for the Space Weather Product Team supporting validation of GOES-R L1b SWx products
- Delivered Post-Launch Test (PLT) and Post-Launch Product Test (PLPT) descriptions

### Upcoming Events:

- GOES-R Mission Ops Review (MOR) – 16-18 June 14
- Final delivery of L2+ science algorithms – 3QFY14
- SPADES Preliminary Design Review (PDR) – 01 Oct 14







# Space Weather Team

## Status: GOES-R Status – SME Assessments




**SME assessments do not represent Program views**

**FOUO**




### EXIS

H/W  (G) No Issues  
L1b  (G) No Issues  
L2+  (G) No Issues

### MAG

H/W  (R/Y) Less mature design – H. Singer suggests more severe rating<sup>1</sup>  
L1b  (R/Y) Impending waivers will likely result in inferior products  
L2+  (G) No Issues




### SEISS

H/W  (Y/G) Hardware waivers will impact overall product performance  
L1b  (G) No issues  
L2+  (G) No issues





### SUVI

H/W  (G) No issues  
L1b  (G) No issues  
L2+  (G) No Issues

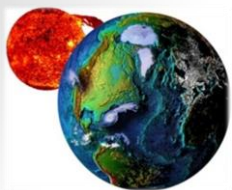
### Products

L0  (Y/G) LZSS access firming up; Interface development separately funded<sup>1</sup>  
L1b  (Y) Operational prototype L1b processing planned; Limited independent development<sup>1</sup>  
L2+  (Y) AA decision to implement L2+ processing within IDP; FY16 PCS submitted<sup>1</sup>

### Access

PDA  (Y) Still working access via PDA and/or GRB; Access to prototype L1b not clear<sup>1</sup>  
GRB  (Y) Still working access via PDA and/or GRB; Access to prototype L1b not clear<sup>1</sup>  
CLASS  (G) No issues  
SPADES  (G) No issues<sup>1</sup>

<sup>1</sup>Assessment or text updated

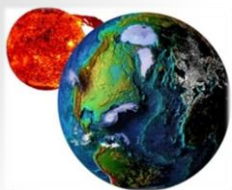


# Space Weather Team

## Status: GOES-R Status – History

FOUO

		2QFY14	1QFY14
EXIS	H/W	G	G
	L1b	G	G
	L2+	G	G
MAG	H/W	R/Y	Y/G
	L1b	R/Y	R/Y
	L2+	G	G
SEISS	H/W	Y/G	Y/G
	L1b	G	G
	L2+	G	G
SUVI	H/W	G	G
	L1b	G	G
	L2+	G	G
Products			
	L0	Y/G	Y
	L1b	Y	Y
	L2+	Y	R
Access			
	PDA	Y	G
	GRB	Y	G
	CLASS	G	G
	SPADES	G	Y



# OUTLINE

## Solar & Terrestrial Physics Division

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STP Division Overview

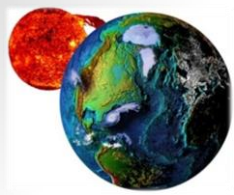
Milestones & Metrics

Program Updates

➔ Special Interest Items

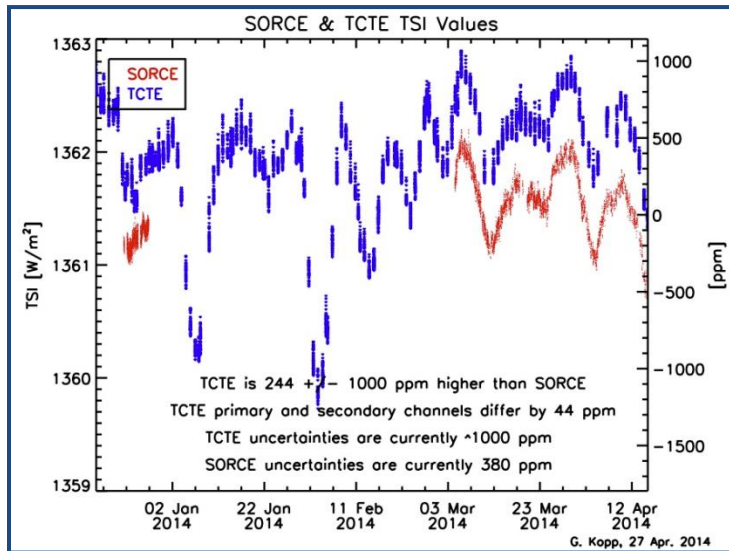
COPC: AF Environmental Data

Issues & Summary



# Special Interest Item

## SWx: TSI Calibration Transfer Experiment



The TSI Calibration Transfer Experiment (TCTE) has achieved one of its goals to obtain overlapping measurements with SORCE. LASP (Greg Kopp) is quite pleased with the quality of the TCTE data and how close these measurements compare with the prior record. Once the higher-quality TSIS/ISS data (accuracy of 100 ppm [0.01%]) overlap with TCTE, the accuracy of the historical record can be established.

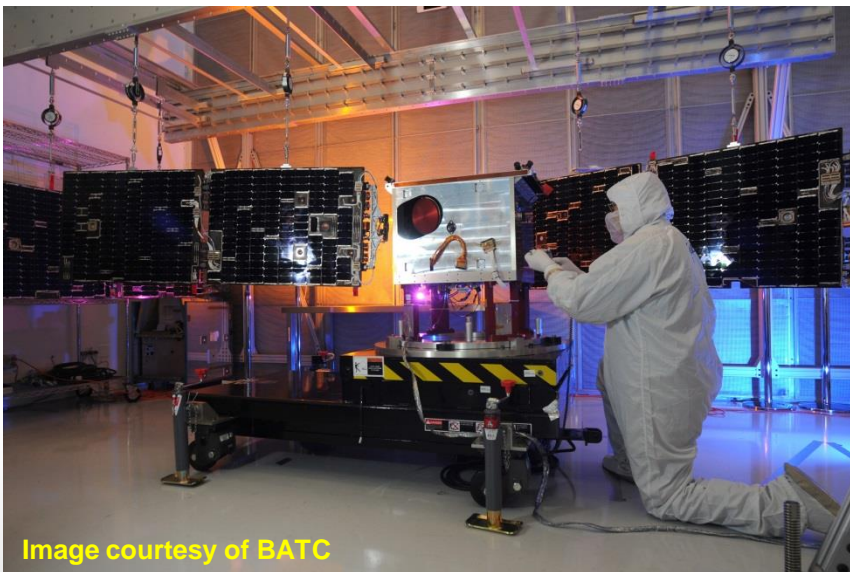
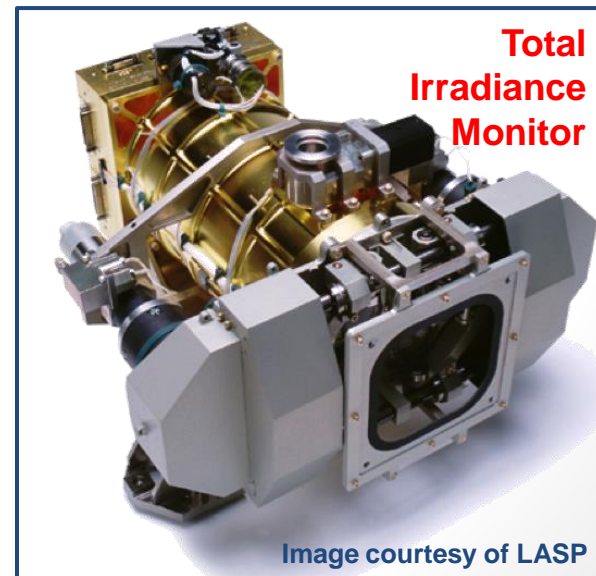


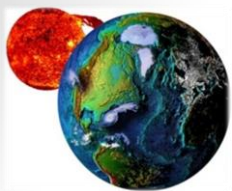
Image courtesy of BATC



Total  
Irradiance  
Monitor

Image courtesy of LASP





# Special Interest Item

## SWx: Space Weather Workshop – Side Meetings

### L1 Requirements Workshop

Doug Biesecker – Monday (4/5)

Objective was to solicit community input on observing priorities and requirements for a DSCOVR follow-on. Baselined instruments are: solar wind mag, solar wind plasma, low energy ions and a coronagraph.

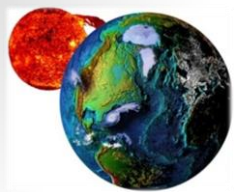
### Solar Energetic Particles

Juan Rodriguez – Friday (4/11)

Objectives were to: discuss the inter-calibration of SEP measurements, foster new inter-calibration efforts and recommend a path forward for establishing a set of guidelines for SEP inter-calibration.



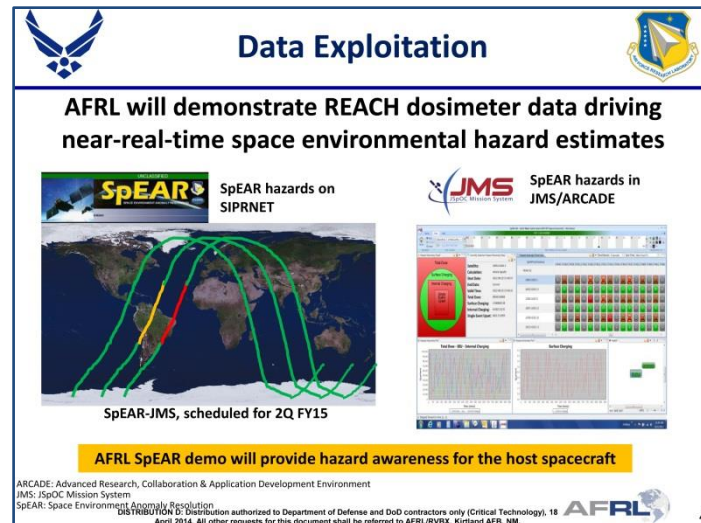
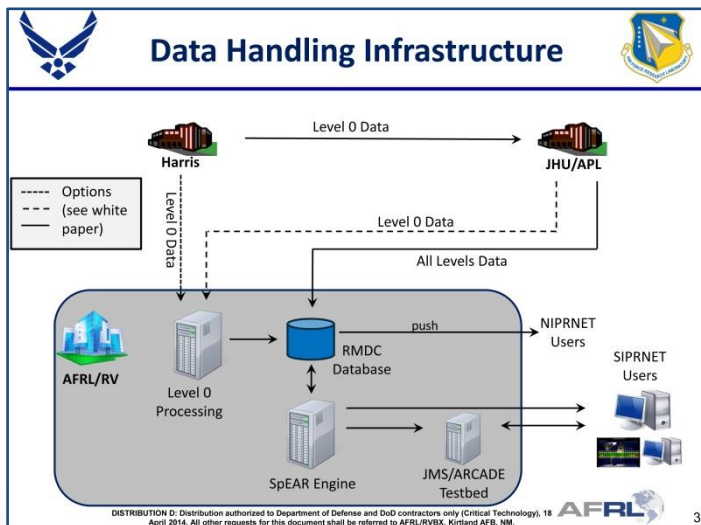




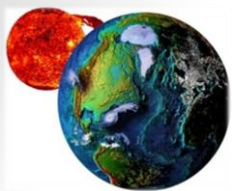
# Special Interest Item

## SWx: REACH Demo – HEALER

The USAF will fly a number of HEALER dosimeters aboard the Iridium constellation of satellites as a part of its Responsive Environmental Assessment Commercial Hosting (REACH) demonstration. Data from these dosimeters will be used for real-time space environmental hazard assessments. AFRL plans to use HEALER data in its Space Environment Anomaly Resolution (SpEAR) project for their “end-to-end data-to-decisions demonstration supporting DoD and commercial satellite operations.” Data made available via the NIPRNET (sensitive but unclassified data) should be available to NGDC in real time.



**Note: Distribution D applies to this slide**



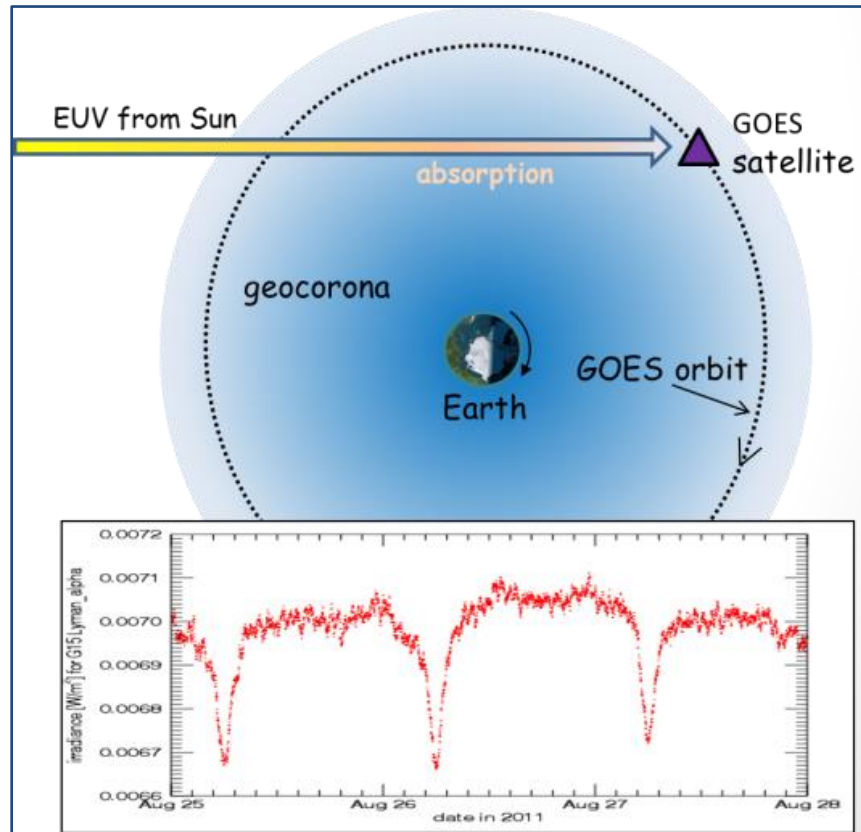
# Special Interest Item

## SWx: CIRES Innovative Research Program (IRP)

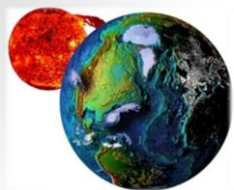
**Janet Machol** and **Paul Loto'aniu** were awarded a competitive CIRES IRP grant to measure the geocorona hydrogen density using solar absorption in the exosphere. This grant dovetails nicely the summer research activities of Janet and Paul's (also Rod Viereck/SWPC and Marty Snow/LASP) incoming REU<sup>1</sup> student Natalie Vezina.

With the continuous operations of the GOES satellites over many years into the future, the results from this study should provide the basis for long-term monitoring of the Hydrogen density in the geocorona and therefore for improved atmospheric and plasma models based on GOES observations.

Sketch to the right provides a view from above the North Pole. Plot shows three days of Lyman- $\alpha$  measurements at 1 minute cadence from a GOES satellite. Multi-hour H absorption dips occur each day.



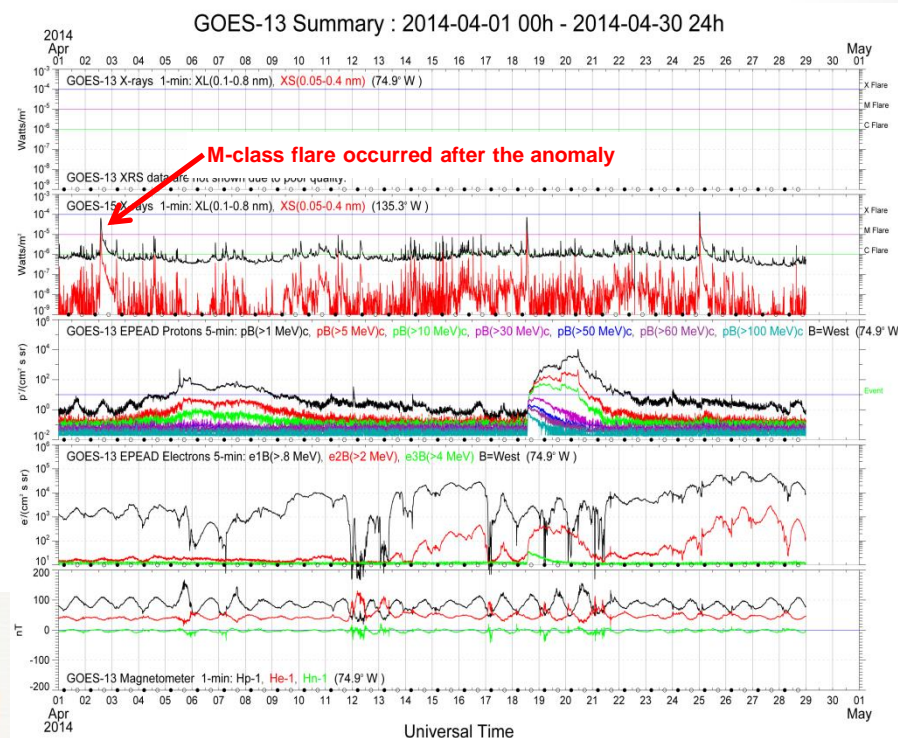
<sup>1</sup>Research Experiences for Undergraduates



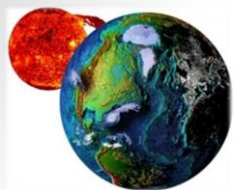
# Special Interest Item

## CORS: GLONASS Outage Incorrectly Linked to SWx

From 22 UTC on 01 Apr 14 until 09 UTC the next day the GLONASS GNSS was providing bad ephemeris data. **Fran Coloma** noted that were early suggestions that the system failure have been due to a solar storm. **Juan Rodriguez** determined that space weather was not a likely contributor to this anomaly. Later reports identified the source of the anomaly as an commanding issue.

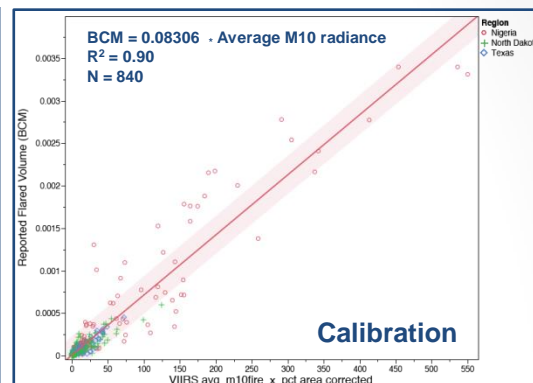
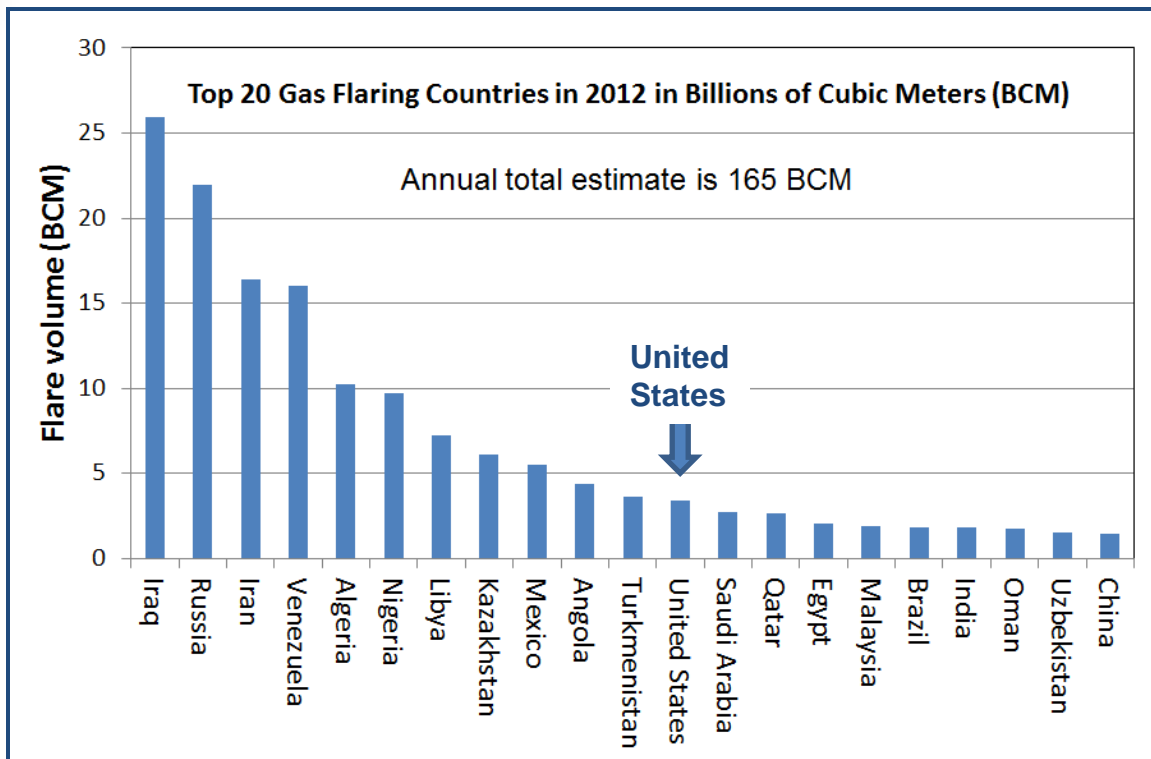


*“It’s possible that the outage is related to either a new M-class solar storm — the start of which was reported about 48 hours ago — or recent X-class solar flare on March 29 at approximately 1700 UTC. The latter event caused a short-term radio blackout about one hour after the flare erupted.” Emptywheel (02 Apr 14)*



# Special Interest Item

## EOG: Global Gas Flaring Reduction

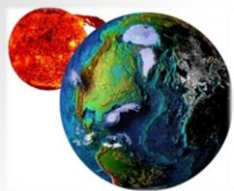


The EOG has released its annual list of gas flaring countries for 2012. The top 20 countries are listed above with the U.S. coming in at #12. The largest single flare was located in Venezuela. NGDC has been monitoring the annual total gas flaring emission volumes for CO<sub>2</sub> since 2006. Current estimates using VIIRS are more accurate than the earlier estimates which relied on DMSP nighttime imagery.



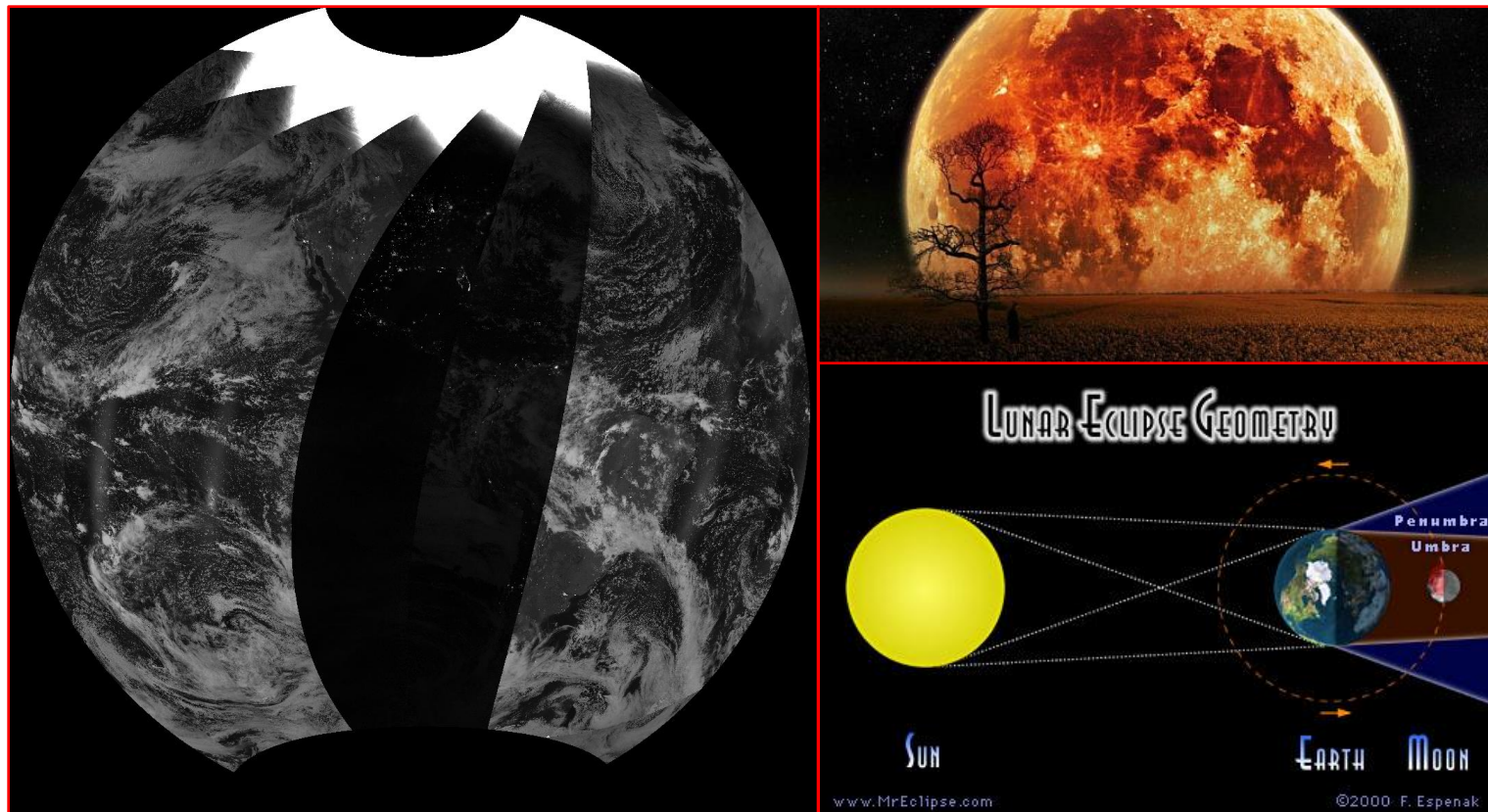




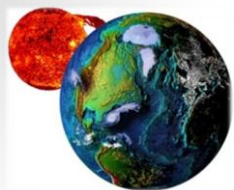


# Special Interest Item

## EOG: VIIRS Lunar Eclipse

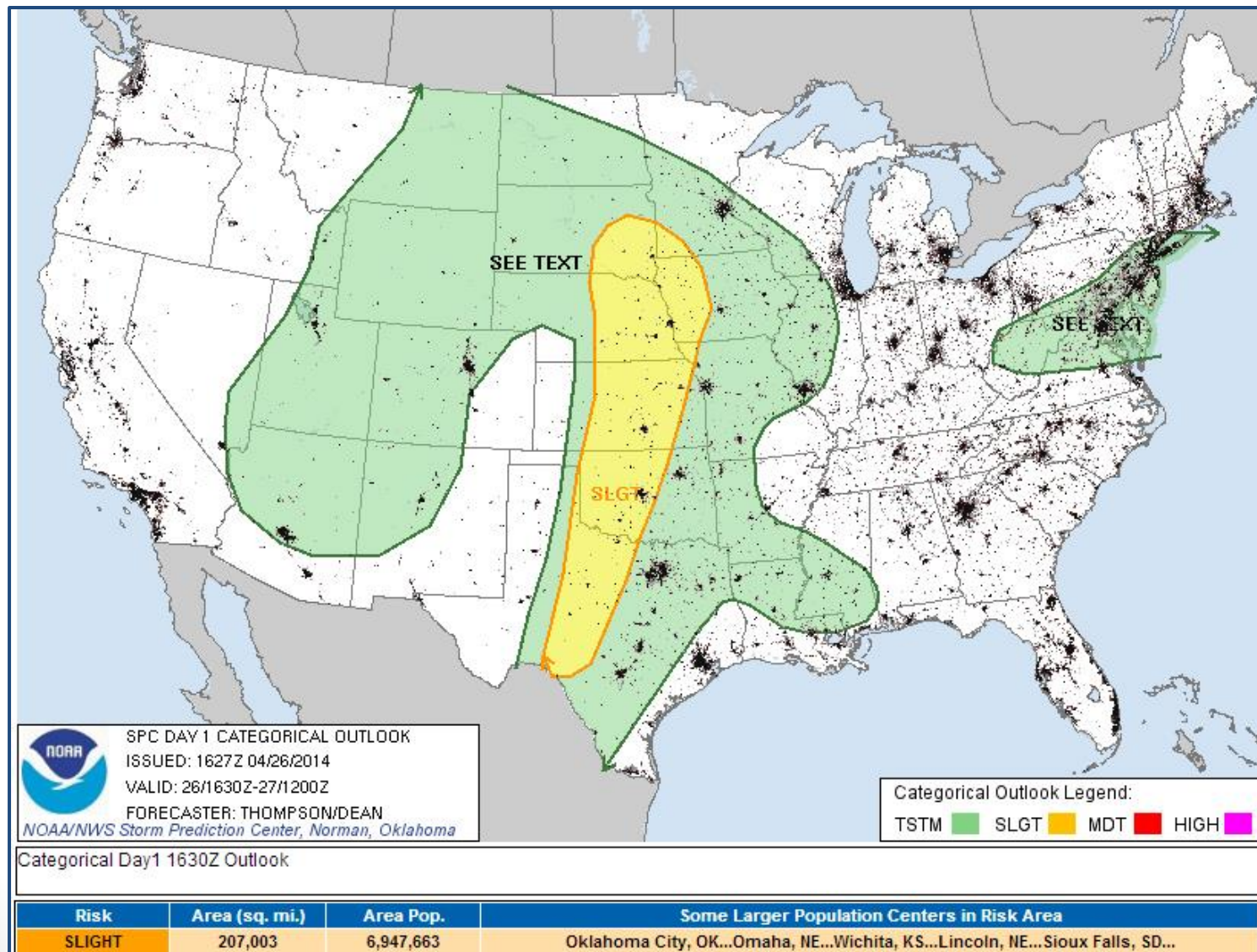


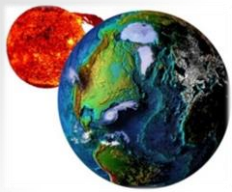
The nighttime lighting effect of the 15 April 2014 lunar eclipse is clearly evident in the VIIRS DNB imagery. The penumbral phase of the eclipse began (ended) at 4:55 UTC (10:38 UTC) with total eclipse lasting from 7:07 to 8:25 UTC.



# Special Interest Item

EOG: *Gotta Love Those Lights* (NOAA SPC)





# OUTLINE

## Solar & Terrestrial Physics Division

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STP Division Overview

Milestones & Metrics

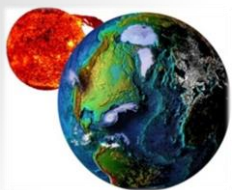
Program Updates

Special Interest Items

➔ COPC: USAF Environmental Data

Issues & Summary





# COPC – AAA of USAF Data

## Introduction: DAPE MOA

U.S. DEPARTMENT OF COMMERCE/ National Oceanic and Atmospheric Administration

OFCM | DEPARTMENT OF COMMERCE  
OFFICE OF THE FEDERAL COORDINATOR  
FOR METEOROLOGICAL SERVICES  
AND SUPPORTING RESEARCH

NOAA U.S. AIR FORCE NAVAL METEOROLOGY AND OCEANOGRAPHY COMMAND

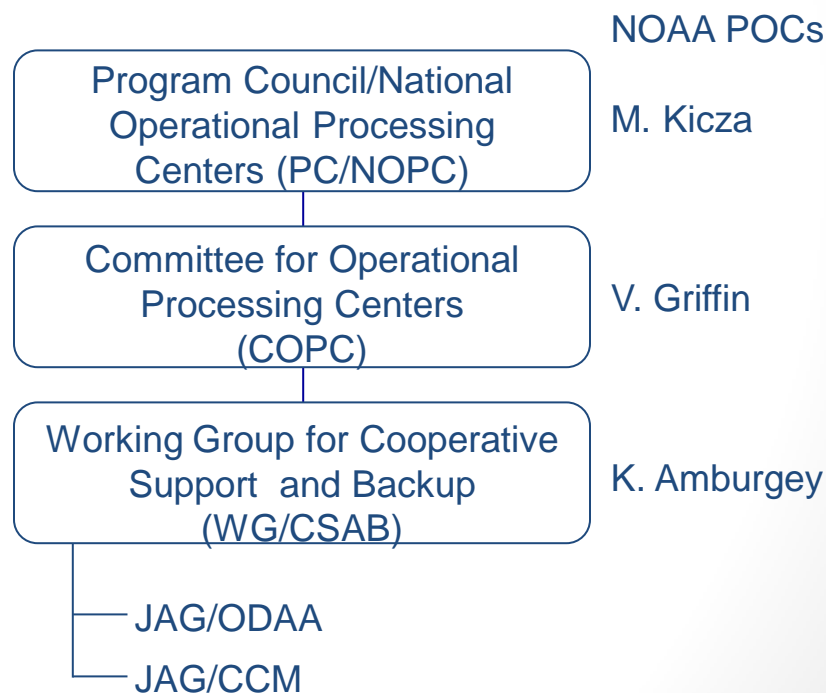
**Memorandum of Agreement**  
for  
**Data Acquisition, Processing,  
and Exchange (DAPE)**

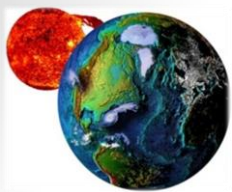
Signed by (PC/NOPC):  
Mary E. Kicza, NESDIC  
Louis Uccellini, NWS  
RDML Brown,, NMOC (Navy)  
COL Egentowich,,AFW (USAF)

Prepared by:  
The Joint Action Group  
for Operational Data  
Acquisition for Assimilation

Renewed: 30 Sep 2013

The renewed MOA-DAPE may provide an appropriate vehicle to replace the expired MOA between AFWA and NGDC for the AAA of USAF satellite and space weather datasets.





# COPC – AAA of USAF Data

## Summary: *Why Engage the COPC?*

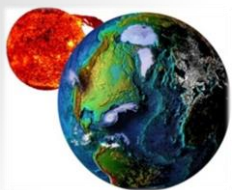
Issue – The Archive, Access and Assessment (AAA) of select USAF environmental data and products was previously covered by an NGDC-AFWA MOU that expired after FY09.

Recommendation – The COPC should direct the WG/CSAB to charter a JAG for the expressed purpose of drafting an annex to the DAPE MOA to define the roles and responsibilities of Program Council/NOPC members for the continued AAA of USAF environmental data by NOAA. Consideration should be given to additional DoD operational datasets for inclusion as well as datasets to depreciate.

Financial Considerations – The costs associated with the AAA of USAF environmental data should be considered. From an historical perspective the NGDC archive of AF data was originally supported on a cost-reimbursable basis. Due to lack of available resources the AF eventually ceased all funding for this activity. Renewed efforts to secure FY13 funding within AFW were unsuccessful.

<sup>1</sup>DMSP data received via McMurdo and forwarded to NGDC for public dissemination in compliance with the Antarctic Treaty is covered by a separate MOA.

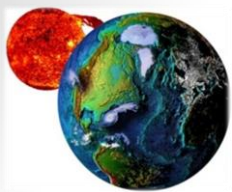




# COPC – AAA of USAF Data

## Datasets: NGDC holdings of AF Operational Data

<u>Dataset</u>	<u>Since</u>	<u>Comments</u>
<b>DMSP</b>		
<i>L0 Telemetry</i>	1994	Only source*
<i>OLS</i>	1994	Only source*
<i>SSJ</i>	1982	Backup to AFRL with public access
<i>SSIES</i>	1987	Backup to AFRL with public access
<i>SSM</i>	1994	Backup to AFRL with public access
<b>Solar</b>		
<i>SEON/SOON</i>		
Drawings	1979	Only source*
Reports	2010	Only source*
<i>SEON/RSTN</i>		
SRS	2000	Only source*
RIMS	1980	Only source*
Reports	2010	Only source*
<b>Ionosonde</b>		
<i>DISS</i>	1981	Redundant source
<i>NEXION</i>	2013	Redundant source



# COPC – AAA of USAF Data

## AF User Survey: Findings<sup>1</sup>

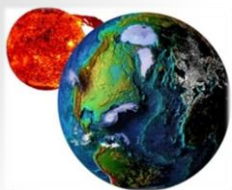
### Air Force Space Command

- AFSPC/A5FW advocates for all the space weather parameters in the attached list of AF owned data elements. Each of these data elements is integrated into AFWA services providing support either directly or indirectly to DoD Space Situational Awareness (SSA) operations
- AFSPC requests continued archival of all space weather data for continued support of Space Situational Awareness.

### Air Force Research Laboratory

- There is a continued need to archive the data sets listed above (SSJ, SSIES, SSM) because of the uses of the data.
- The SOON data archived at NGDC are derived properties of solar optical emission generated at the SOON sites, such as active region numbers, sunspot area, and strength of flares. This data are used by AFRL at different levels of research.
- AFRL regards these RSTN data as critical for continued studies aimed at forecasting solar events that can affect USAF communications, navigation and radar.
- AFRL notes that they would like to see these data archived but it doesn't necessarily need to be archived at NGDC.

<sup>1</sup>Paraphrased – full text included on notes pages

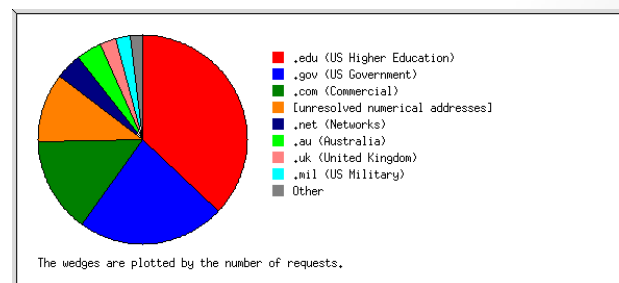
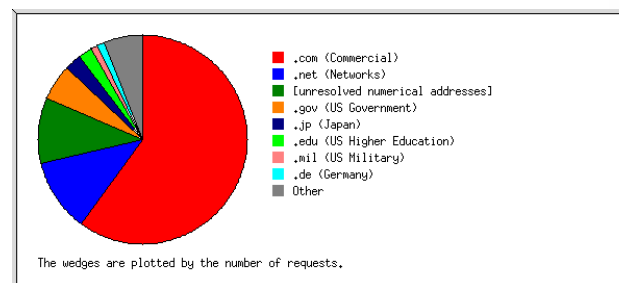
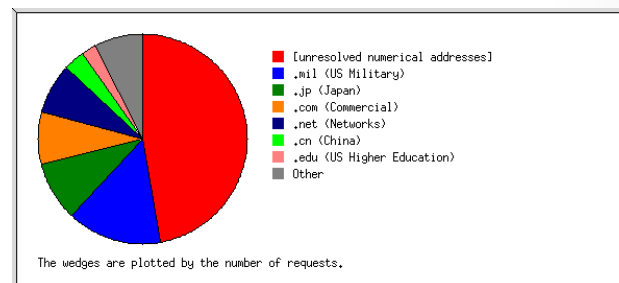


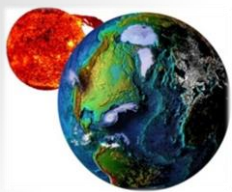
# COPC – AAA of USAF Data

## Web Statistics: Data Usage and Details

In FY13 the AFWA requested information regarding the usage of USAF data. This analysis was gleaned from NGDC YTD web statistics

- DMSP data (mostly OLS)
  - Requests (all): 4,428,709
  - Requests (.mil): 620,019 (14.6%)
  - Requests (.gov): 50,487 (1.14%)
  - Total download: 5.44 TB
  - Details: DMSP SWx (37,643)
- Solar data (includes USAF – see details)
  - Requests (all): 15,973,043
  - Requests (.mil): 177,301 (1.11%)
  - Requests (.gov): 894,490 (5.50%)
  - Total download: 3.49 TB
  - Details: RSTN (342,853); SOON (87,415)
- Ionosonde data (Data provider to AFWA)
  - Requests (all): 37,492,801
  - Requests (.mil): 847,337 (2.26%)
  - Requests (.gov): 8,510,866 (22.7%)
  - Total download: 5.41 TB



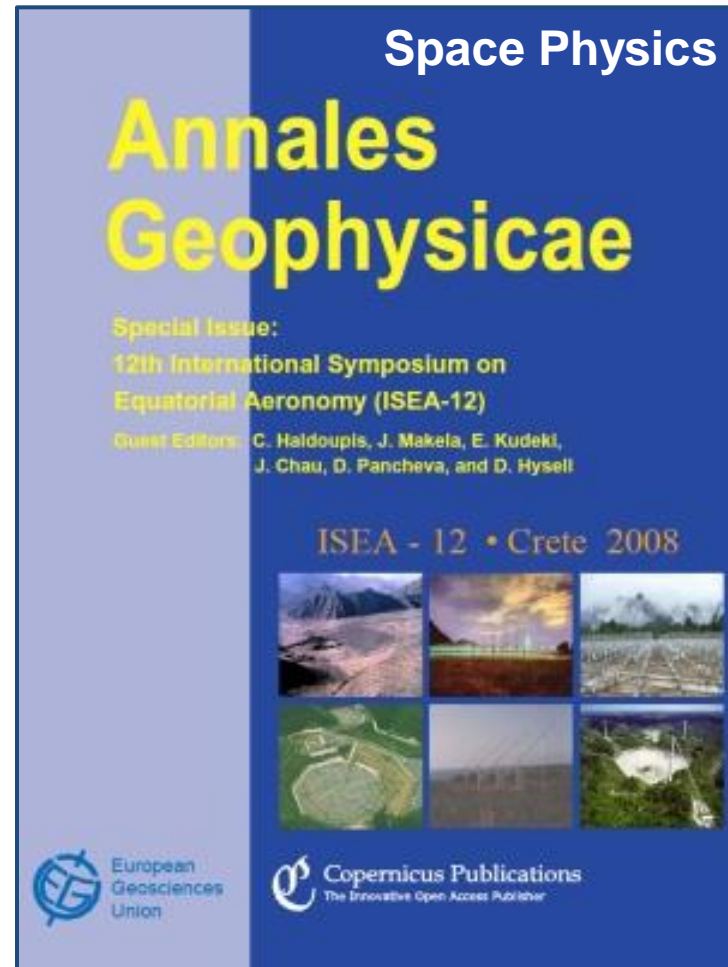


# COPC – AAA of USAF Data

Research: DMSP SWx Data Used for Science

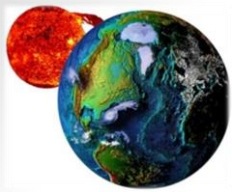


**Articles: 3,579**



**Articles: 707**

DMSP SWx mostly refers to SSJ/SSIES/SSM



# OUTLINE

## Solar & Terrestrial Physics Division

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STP Division Overview

Milestones & Metrics

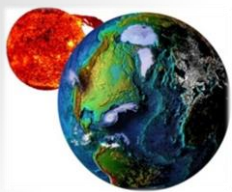
Program Updates

Special Interest Items

COPC: AF Environmental Data

➔ Issues & Summary



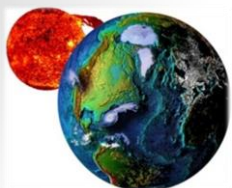


# Issues & Summary

## STP YTD FY14 Publications – 16 (1 of 3)

### Publications (YTD):

- Bordikar, M. R., W. A. Scales, A. Mahmoudian, H. Kim, P. A. Bernhardt, **R. Redmon**, A. R. Samimi, S. Brizcinski, and M. J. McCarrick (2014), Impact of active geomagnetic conditions on stimulated radiation during ionospheric second electron gyroharmonic heating, *J. Geophys. Res. Space Physics*, 119, pp. 548–565, doi:10.1002/2013JA019367. **[Peer reviewed]**
- Clilverd, M. A., N. Cobbett, C. J. Rodger, J. B. Brundell, M. H. Denton, D. P. Hartley, **J. V. Rodriguez**, D. Danskin, T. Raita, and E. L. Spanswick (2013), Energetic electron precipitation characteristics observed from Antarctica during a flux dropout event, *J. Geophys. Res. Space Physics*, 118, 6921–6935, doi:10.1002/2013JA019067. **[Peer reviewed]**
- Elvidge, C.D.** (2013), Space Based Surveillance Tools for Monitoring of Fisheries, Proceedings of the Asian Conference on Remote Sensing, Bali, India, 20-24 Oct 2013.
- Elvidge, C.D., K. Baugh, F-C Hsu and M. Zhizhin** (2013), SNPP Data Access of Agricultural Monitoring, Proceedings of the Asian Conference on Remote Sensing, Bali, India, 20-24 Oct 2013.
- Erwin, E.H., H.E. Coffey, W.F. Denig, D.M. Willis, R. Henwood and M.N. Wild** (2013), The Greenwich Photoheliographic Results (1874 – 1976): Initial Corrections to the Printed Publications, *Solar Physics*, 288, pp. 157-170. doi: 10.1007/s11207-013-0310-z **[Peer reviewed]**
- Hartley, D. P., M. H. Denton, **J. C. Green**, T. G. Onsager, **J. V. Rodriguez**, and H. J. Singer (2013), Case studies of the impact of high-speed solar wind streams on the electron radiation belt at geosynchronous orbit: Flux, magnetic field, and phase space density, *J. Geophys. Res. Space Physics*, 118, 6964–6979, doi:10.1002/2013JA018923. **[Peer reviewed]**
- Knipp, D. J., T. Matsuo, L. Kilcommons, A. Richmond, B. Anderson, H. Korth, **R. Redmon**, B. Mero, and N. Parrish (2014), Comparison of magnetic perturbation data from LEO satellite constellations: Statistics of DMSP and AMPERE, *Space Weather*, 12, 2–23, doi:10.1002/2013SW000987. **[Peer Reviewed]**
- Kress, B.T., **J.V. Rodriguez**, J.E. Mazur and M. Engel (2013), Modeling solar proton access to geostationary spacecraft with geomagnetic cutoffs, *Adv. Space Res.*, 52, 1939-1948. <http://dx.doi.org/10.1016/j.asr.2013.08.019> **[Peer reviewed]**

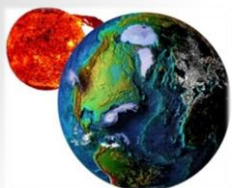


# Issues & Summary

## STP YTD FY14 Publications – 16 (2 of 3)

### Publications (continued):

- Rodriguez, J.V.**, J.C. Krosschell and J.C. Green (2014), Intercalibration of GOES 8-15 solar proton detectors, *Space Weather*, 12, 92-109. doi: 10.1002/2013SW000996 [**Peer reviewed**]
- Sandholt, P.E., C.J. Farrugia and **W.F. Denig** (2014), M-I Coupling Across the Auroral Oval at Dusk and Midnight: Repetitive Substorm Activity Driven by Interplanetary Coronal Mass Ejections (CMEs), *Ann. Geophys.*, 32, 333-351. doi: 10.5194/angeo-32-333-2014 [**Peer Reviewed**]
- Snow, M., M. Weber, **J. Machol**, R. Viereck and E. Richard (2014) Comparison of Magnesium II Core-to-Wing Ratio Observations During Solar Minimum 23/24, *J. Space Weather Space Clim.*, 4, A04, doi:10.1051/swsc/2014001. [**Peer reviewed**]
- Soloviev, A., A. Khokhlov, E. Jalkovsky, A. Berezko, A. Lebedev, E. Kharin, I. Shestolaplv, M. Manda, V. Kuznetsov, T. Bondar, **J. Mabie**, M. Nisilevich, V. Nechitailenko, A. Rybkina, O. Pyatygina and A. Shibaev (2013), The Atlas of the Earth's Magnetic Field, eds. A. Gvishiani, A. Frolov and V. Lapshin, Publ. GC RAS, Moscow, 361 p. doi:10.2205/2013/BS011\_Atlas\_MPZ
- Turner, D. L., V. Angelopoulos, S. K. Morley, M. G. Henderson, G. D. Reeves, W. Li, D. N. Baker, C.-L. Huang, A. Boyd, H. E. Spence, S. G. Claudepierre, J. B. Blake and **J. V. Rodriguez** (2014), On the cause and extent of outer radiation belt losses during the 30 September 2012 dropout event, *J. Geophys. Res. Space Physics*, 119, 1530–1540, doi:[10.1002/2013JA019446](https://doi.org/10.1002/2013JA019446). [**Peer Reviewed**]
- Turner, D. L., V. Angelopoulos, W. Li, J. Bortnik, B. Ni, Q. Ma, R. M. Thorne, S. K. Morley, M. G. Henderson, G. D. Reeves, M. Usanova, I. R. Mann, S. G. Claudepierre, J. B. Blake, D. N. Baker, C.-L. Huang, H. Spence, W. Kurth, C. Kletzing and **J. V. Rodriguez** (2014), Competing source and loss mechanisms due to wave-particle interactions in Earth's outer radiation belt during the 30 September to 3 October 2012 geomagnetic storm, *J. Geophys. Res. Space Physics*, 119, 1960–1979, doi:[10.1002/2014JA019770](https://doi.org/10.1002/2014JA019770). [**Peer Reviewed**]
- Willis, D.M., **H.E. Coffey**, R. Henwood, **E.H. Erwin**, D.V. Hoyt, M.N. Wild and **W.F. Denig** (2013), The Greenwich Photo-heliographic Results (1874 – 1976): Summary of the Observations, Applications, Datasets, Definitions and Errors, *Solar Physics*, 288, pp. 117-139. doi 10.1007/s11207-013-0311-y [**Peer reviewed**]



# Issues & Summary

## STP YTD FY14 Publications – 16 (3 of 3)

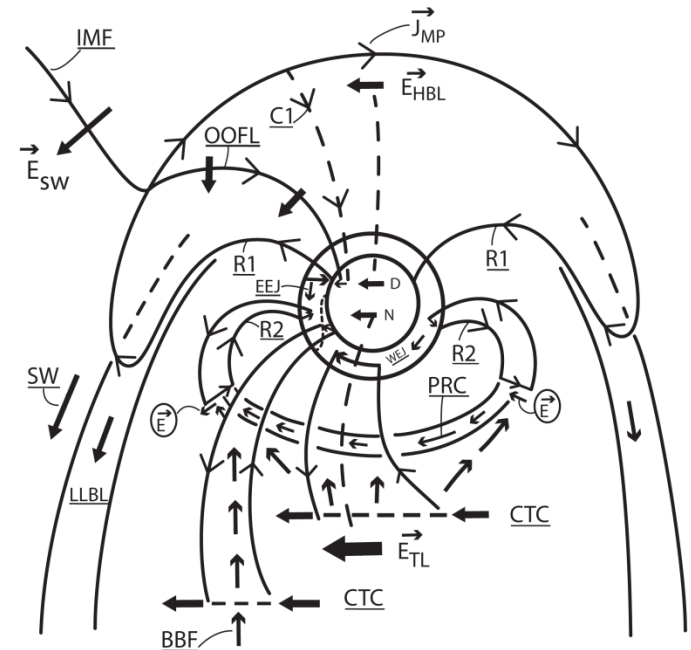
### Publications (continued):

Willis, D.M., R. Henwood, M.N. Wild, **H.E. Coffey**, **W.F. Denig**, **E.H. Erwin** and D.V. Hoyt (2013), The Greenwich Photo-heliographic Results (1874 – 1976): Procedures for Checking and Correcting the Sunspot Digital Datasets, *Solar Physics* , 288, pp. 141-156. doi 10.1007/s11207-013-0312-x [**Peer reviewed**]

Total accepted or published: 16  
**Peer Reviewed: 14**

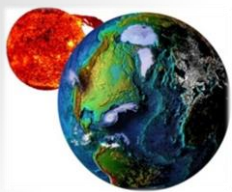


**STP 2QFY14 30-APR-14**



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# Issues & Summary

## Solar & Terrestrial Physics Division

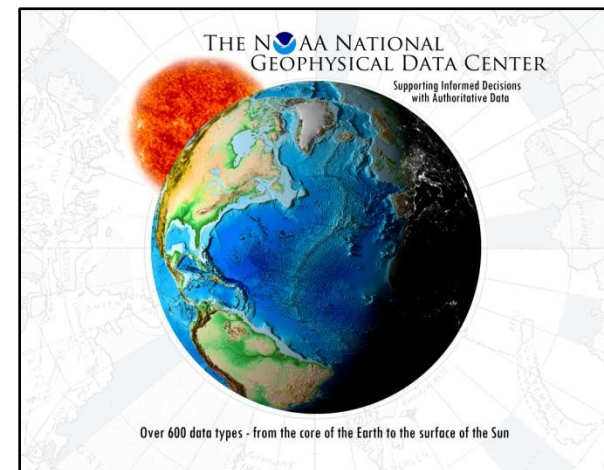
- ✓ NGS Aerial Photography (4QFY13) – **Some positive movement**
- ✓ GOES-R SWx Algorithm Risks (4QFY13) – **Improving**
- ✓ Fed hiring restrictions having mission impact (3QFY12) – **Much better**
- ✓ GOES-R L2+ SWx algorithms (3QFY11) – *Path to operations defined*
  - Frozen Baseline / Algorithm Readiness – Waivers – **Improving**
  - GOES L0 Data Not in CLASS – **Solved (trust but verify)**
  - GOES-R Data Management Tasks – GOES-R Data Mngr – **@ CIRES**

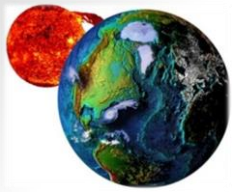
### Metrics

Papers (FY14-YTD): 16

✓ Peer Reviewed: 14

Presentations (FY14-YTD): 36





# QUESTIONS?

